

important contributions to our knowledge of the variable stars, the eighth of a series commenced in No. 1628, ten years since. The observations discussed in the last communication were chiefly made in 1874, but there are also observations of several objects to the middle of the present year. In the comparisons of the observed epochs of maxima and minima with those calculated, the elements in Schönfeld's second Catalogue (Manheim, 1875), which should be in the hands of every observer of variable stars, have been employed, while in a few cases new elements are given.

Mira Ceti was at minimum 1874, Nov. 20 (mag. 8.6), and at maximum 1875, March 4 (mag. 2.5), the latter being about eight days later than is deduced from Argelander's formula of sines.—T Tauri, the star adjoining the variable nebula in Taurus (Hind, 1852), has exhibited irregular fluctuations between the years 1868 and 1875; previous to 1868 it had occasionally been as bright as 9.5, but according to Schönfeld's observations since that year, it has not been higher than 10.3, while at a maximum, 1871 Nov. 25, it was only 12.0, and at another very certain one, 1874 Feb. 10, it was 11.7. Schönfeld states that the nebula of 1852 was invisible in the Manheim refractor (6.5 inches aperture) during the whole period 1868-75, while the small nebula detected by Mr. Otto Struve immediately preceding this was only occasionally glimpsed. This spot requires to be closely watched with large instruments.—U Geminorum was satisfactorily observed at a maximum, 1874 Feb. 4.4 (mag. 9.6), 111 days after the preceding one; another maximum may be expected at the beginning of January next, or possibly in the last days of the present month; since the discovery of this star in 1855, it has shown variation of period between about 70 and 150 days.

R Crateris, the star following  $\alpha$ , which Sir John Herschel describes (Cape Obs., p. 448) as of "a most intense and curious colour," and "scarlet, almost blood colour," has exhibited during the last ten years a slight variation estimated from 8.2 to 8.9 mag., but the observations have not afforded any epoch to assist in determination of elements.—S Virginis has been twice observed by Schönfeld at minimum viz., 1874, April 20 (mag. 12.5), and 1875, April 26 (mag. 12.4), which he believes are the first minima yet secured; at certain maxima this star becomes distinctly visible without the telescope (mag. 5.7).— $\chi$  Cygni attained a maximum 1874, Nov. 9, mag. 4.7, or about midway between  $\phi$  and  $\eta$  Cygni; this epoch is upwards of two months later than the date assigned by Argelander's formula in the Bonn Observations, vol. vii., but the extreme difference between the formula and observation appears to have occurred in 1870, when it exceeded three months; the star must be near a maximum at the present time.—R Vulpeculæ: the further observations support the addition of the term depending on  $E^2$  introduced in Schönfeld's last catalogue; he remarks that a uniform period would involve differences from the observed epochs amounting to twenty-two days, while these epochs are uncertain to three days at the most.—S Pegasi. This star, detected by Mr. Marth at Malta, 1864, Nov. 24, when its magnitude was 8.3, was at maximum 1874, July 8 (mag. 7.3): it must not be confounded with the star which first appeared upon our list of variables as S Pegasi, the insertion of which probably arose from an error of observation. The position of the variable for 1876.0 is in R.A., 23h. 13m. 46s; N.P.D.,  $81^{\circ} 48' 8''$ .

The following are Greenwich times of geocentric minima of Algol according to the third elements of Schönfeld (Der Lichtwandel des Sterns Algol in Perseus. Manheim, 1870).

	d.	h.	m.		d.	h.	m.
1875.	Dec. 24	15	7	1876.	Jan. 2	5	35
"	" 27	11	57	"	" 16	13	41
"	" 30	8	46	"	" 19	10	30
				"	" 22	7	20

The next maximum of Mira Ceti may be expected about January 17.

THE MINOR PLANETS.—M. Bossert has calculated elements of the small planet discovered by M. Paul Henry at Paris, Nov. 2, from which it appears the planet is not identical with No. 98, Dike, as surmised by Prof. Tietjen, and the actual number in this group, therefore, stands at 157. The best orbit of Dike is that of MM. Lœwy and Tisserand (*Comptes Rendus*, 1872, Feb. 19), and is subjoined with M. Bossert's for No. 152, for the sake of comparison.

	No. 98, Dike.	No. 152.
Longitude of perihelion ...	$240^{\circ} 35' 34''$	$80^{\circ} 0' 3''$
Ascending node ...	$41^{\circ} 43' 42''$	$41^{\circ} 28' 49''$
Inclination ...	$13^{\circ} 53' 18''$	$12^{\circ} 10' 13''$
Angle of excentricity ...	$13^{\circ} 47' 30''$	$4^{\circ} 42' 59''$
Log. semi-axis major ...	0.446639	0.49582
Long. from equinox of ...	1868.0	1875.0

Circular No. 37, issued by Prof. Tietjen, contains ephemerides of Sylvia, Austria, No. 148 with elements from two months' observations, No. 150, No. 151 from elements founded on three weeks' observations, No. 152, No. 153, and No. 156: a circular orbit of the latter places the ascending node in  $253^{\circ} 52'$ , with an inclination of  $4^{\circ} 42'$ .

COGGIA'S COMET, 1874.—Dr. Schmidt, Director of the Observatory at Athens, publishes the first portion of the results of his observations on the appearance of the great comet of 1874, between May 3 and July 23, when he believes to have glimpsed the tail for the last time. The observations refer to the brightness of the nucleus as viewed in the telescope, and of the head of the comet seen with the naked eye, the apparent length of the tail, and semi-diameter of the coma; the measures are not reduced to actual values, in the absence of a complete ephemeris from good elements. On June 9 and subsequently the nucleus was always remarked to be yellow, and the mean of its apparent diameters, given by Dr. Schmidt, would be, for the earth's mean distance, about  $0''.65$ , or 290 miles, as we find by taking the distance of the comet from the earth, deduced from one of the best parabolic orbits.

#### HUMAN ANATOMY AS A PART OF THE BIOLOGICAL CURRICULUM

WE would draw the attention of our readers to the following "minute" from Cambridge, dated Dec. 2 :—  
"The Board of Natural Sciences Studies report that the study of human anatomy in the University is at a disadvantage in consequence of its not occupying a more prominent and definite position in the Natural Sciences Tripos. It is found from experience that medical students who are candidates for the Natural Sciences Tripos relinquish the study of human anatomy until after the examination for the Tripos, and many are therefore deterred from making the attempt to obtain a degree with honours. Further, the more distinct recognition of human anatomy in the examination for the Tripos cannot fail to elevate the character of the teaching and study of it in the University as a branch of science, especially as it is contemplated by the Board that the subject of human anatomy shall include the mechanism of the human body, the comparison of its parts with those of lower animals, its development, &c. In proposing this addition to the subjects of the Natural Sciences Tripos it is not intended to add to the number of subjects with which students are expected to be acquainted; but the subjects represented in the examination are now so numerous and extensive that they have become practically, to a large extent, alternative, and the additional subject would, it is thought, prove attractive to a large number of students. The addition would also help to maintain the connection between the schools of Natural Science and Medicine.

The two days allowed for the examination in practical work in the second part of the examination is scarcely sufficient, and as the number of candidates increases, more time will certainly be required. The Board recommends some alterations in and additions to the regulations for the Natural Sciences Tripos, which will accomplish the object it has in view."

The Biological Schools of the older Universities, on account of their recent origin, are still in a far from settled state. Men who have had a previous education in some other medical school enter as undergraduates, and on more than a single occasion these have had the opportunity of demonstrating to the less highly educated of their year how great is the value of a knowledge of human anatomy, and how excellent a scientific training it forms.

The Board of Natural Science Studies at Cambridge mention as the first claim in favour of the greater stress which it desires to lay on anatomy, that medical students suffer from its omission, and are tempted to delay their special work. We are not among those who believe that the Universities will ever form good medical schools. The advantage of the University curriculum is that it prolongs the *higher* education through the period during which the mind is acquiring its reasoning powers, and, as a result, tends to strengthen these by continually varying the material to be reasoned on. Except as far as the production of teachers of the subjects it inculcates are concerned, it has not, and ought not to have, any direct ulterior objects in view. If medicine is to be specially studied we see no limits to the extension of the subjects embraced within it. The practice of medicine by most is hardly more than a trade, and why, as such, it should be more highly favoured than any other special training it is difficult to understand.

The arguments in favour of making human anatomy a part of the biological education are of a very different nature, and are insuperable. The study of zoology may be commenced at either end, with the simplest protozoa, or with a foundation of human anatomy. Both of these have their advantages. A glance at the previous education of those who are, at the present day, devoting themselves to the subject, shows that almost all who commenced it after having mastered human anatomy, have devoted themselves to the vertebrate sub-kingdom; whilst those who have commenced without any or with but little knowledge of anthropotomy, have taken to the invertebrata. The intricacy of the higher forms, and the standard of comparison afforded by the structure of the human frame, naturally leads to a comparison of this with those of its closest allies, and consequently places the vertebrata in a more favourable position for investigation. It also helps to develop a greater interest in human anatomy from the light thrown on it by those of less elaborate organisation.

The student who commences with the lowest sub-kingdoms has to acquire his training as well as his facts from the simpler forms, amongst which there is so little correlation that he is led to lay little stress on that general uniformity of type which seems to him to detract from the interest of a group apparently presenting so little variety among its different members.

Under the existing system, therefore, the tendency of the University education is to develop invertebrate rather than vertebrate zoologists, and this condition is capable of being modified in the direction of improvement by the introduction of human anatomy into the biological curriculum; for then those who take up such subjects might have the opportunity of acquiring the knowledge of vertebrate anatomy to an extent which would place them in a position that would prevent them from laying themselves open to the correction, by any anthropotomist, of their otherwise shallow information on vertebrate structure.

As to the character of the human anatomy which is

required by the student of biology, it is a mistake to suppose that it is exactly that needed by the surgeon or medical man. In almost all manuals of the subject great stress has to be laid on relational anatomy, because this is the aspect of the subject required by them. Nevertheless a very fair and biologically valuable knowledge of the structure of the human body can be acquired without any necessity for so much time being spent in the mastery of the exact relations, through the whole of their course, of vessels and nerves. A thorough training in osteology, the disposition of the various viscera and nerve centres, and the structure of the organs of sense, together with a comparatively slight acquaintance with the exact course followed by each nerve, artery, and vein, is all that is required by the majority of comparative anatomists. Upon such a basis any special regional relationships might be mastered in a short time with but little difficulty, and if the student afterwards commenced a medical training, he would do so on a footing of peculiar advantage.

The latter part of the report above quoted attracts attention in another direction also. From it we learn that "the subjects represented in the examination are now so numerous and extensive that they have become practically to a large extent alternative." This we very much regret, and we are convinced that this tendency in the direction of the system adopted at Oxford will be as little satisfactory as it has proved in that University. It has the effect of turning out a number of narrow specialists, instead of, as it ought to do, starting the student in some definite direction with a fund of general information, which he will find invaluable after he has taken his degree.

#### THE BIRDS OF THE PELEW ISLANDS\*

THE eighth part of the "Journal des Muséum Godeffroy," which has been lately issued at Hamburg, contains an interesting article upon the Birds of the Pelew Islands, from the pen of the well-known ornithologist, Dr. Otto Finsch, of Bremen. This group of islands, until recently almost unknown to naturalists, has of late years been visited by several collectors in the employment of the House of Godeffroy, who have transmitted to Europe full series of specimens of its natural productions. Dr. Finsch, in conjunction with Dr. Hartlaub, has already published various notices of these collections, and given descriptions of several new and most interesting species which they contained. The present memoir gives a *résumé* of the previous articles, and adds a complete account of all that is yet known concerning the ornithology of this far-removed group of islands. The total number of species of birds as yet ascertained to occur within their limits is fifty-six, of which twelve are peculiar to the group, and are not known to be found elsewhere. Perhaps one of the most remarkable facts connected with the ornithology of the Pelew Islands is the occurrence of a Jungle Fowl (*Gallus bankiva*)—being the species generally recognised as the original of our domestic fowl—in a wild state. It is possible, however, that this may be an introduction. It is singular also to note that the Nicobar Pigeon (*Calenas nicobarica*) has spread thus far to the west. Noteworthy again is the entire absence, so far as is hitherto known, of parrots and finches in these islands. Dr. Finsch's excellent text furnishes complete details upon these and other points of interest, and contains full authorities for the occurrence of all the species attributed to the avifauna of the Pelew Islands. Five well-executed, coloured plates give illustrations of some of the rarer species and adorn the work. Of the physical features of these islands an account has already appeared in a former number of the same journal, together with an excellent map of the group.

\* "Zur Ornithologie der Südsee-Inseln." I. Die Vögel der Palau-Gruppe. Von Dr. Otto Finsch in Bremen. "Journal des Muséum Godeffroy," Heft viii., 1875.